

WHAT IS CLAIMED IS:

- 1 1. An isolated antibody that binds specifically to a stalk of CD30 (SEQ
2 ID NO:1) of a cell, or to an epitope destroyed upon cleavage of soluble CD30 ("sCD30")
3 from intact CD30.
- 1 2. An antibody of claim 1, wherein said antibody is selected from the
2 group consisting of an Fab, a single chain variable region ("scFV"), and a disulfide stabilized
3 recombinant variable region ("dsFv").
- 1 3. An antibody of claim 1, which binds to a peptide selected from the
2 group consisting of: residues 329 to 379 of SEQ ID NO:1, residues 339 to 379 of SEQ ID
3 NO:1, residues 349 to 379 of SEQ ID NO:1, residues 359 to 379 of SEQ ID NO:1, and
4 residues 369 to 379 of SEQ ID NO:1.
- 1 4. An antibody of claim 1, which binds to an epitope of CD30 mapping to
2 Epitope IIa or Epitope VI of CD30 (SEQ ID NO:1).
- 1 5. An antibody of claim 4, which has the complementarity determining
2 regions ("CDRs") of antibody T105, as shown in Figures 2a and b.
- 1 6. An antibody of claim 1, which has the complementarity determining
2 regions ("CDRs") of antibody T201, as shown in Figures 2a and b.
- 1 7. A composition comprising an antibody of claim 1, conjugated or fused
2 to a therapeutic moiety.
- 1 8. A composition comprising an antibody of claim 3, conjugated or fused
2 to a therapeutic moiety.
- 1 9. A composition comprising an antibody of claim 4, conjugated or fused
2 to a therapeutic moiety.
- 1 10. A composition comprising an antibody of claim 5, conjugated or fused
2 to a therapeutic moiety.
- 1 11. A composition comprising an antibody of claim 6, conjugated or fused
2 to a therapeutic moiety.

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1 12. A composition of claim 7, wherein the therapeutic moiety is selected
2 from the group consisting of a cytotoxin, a drug, a radioisotope, or a liposome loaded with a
3 drug or a cytotoxin.

1 13. A composition of claim 8, wherein the therapeutic moiety is selected
2 from the group consisting of a cytotoxin, a drug, a radioisotope, or a liposome loaded with a
3 drug or a cytotoxin

1 14. A composition of claim 9, wherein the therapeutic moiety is selected
2 from the group consisting of a cytotoxin, a drug, a radioisotope, or a liposome loaded with a
3 drug or a cytotoxin.

1 15. A composition of claim 10, wherein the therapeutic moiety is selected
2 from the group consisting of a cytotoxin, a drug, a radioisotope, or a liposome loaded with a
3 drug or a cytotoxin.

1 16. A composition of claim 11, wherein the therapeutic moiety is selected
2 from the group consisting of a cytotoxin, a drug, a radioisotope, or a liposome loaded with a
3 drug or a cytotoxin.

1 17. A composition of claim 15, wherein the cytotoxin is selected from the
2 group consisting of ricin A, abrin, ribotoxin, ribonuclease, saporin, calicheamycin, diphtheria
3 toxin, a *Pseudomonas* exotoxin, and botulinum toxins A through F.

1 18. A composition of claim 12, wherein the cytotoxin is selected from the
2 group consisting of ricin A, abrin, ribotoxin, ribonuclease, saporin, calicheamycin, diphtheria
3 toxin, a *Pseudomonas* exotoxin, and botulinum toxins A through F.

1 19. A composition of claim 18, wherein said *Pseudomonas* exotoxin is
2 selected from the group consisting of PE35, PE38, PE38KDEL, PE40, PE4E, and PE38QQR.

1 20. A composition of claim 7, further comprising a pharmaceutically
2 acceptable carrier.

1 21. A use of an anti-CD30 antibody that binds specifically to a stalk of
2 CD30 (SEQ ID NO:1) of a cell, or to an epitope destroyed upon cleavage of sCD30 from

3 intact CD30, for the manufacture of a medicament to inhibit the growth of a CD30+ cancer
4 cell.

1 22. A use of claim 21, wherein said antibody is selected from the group
2 consisting of an scFv, dsFv, a Fab, or a F(ab')₂.

1 23. A use of a composition, which composition comprises an antibody of
2 claim 1 conjugated or fused to a therapeutic moiety, for the manufacture of a medicament for
3 inhibiting growth of a CD30+ cancer cell.

1 24. A use of claim 23, wherein the therapeutic moiety is selected from the
2 group consisting of a cytotoxin, a drug, a radioisotope, or a liposome loaded with a drug or a
3 cytotoxin.

1 25. A use of claim 24, wherein said cytotoxin is a *Pseudomonas* exotoxin.

1 26. A use of claim 25, wherein the *Pseudomonas* exotoxin is PE38.

1 27. A nucleic acid encoding an antibody that binds specifically to a stalk of
2 CD30 (SEQ ID NO:1) of a cell, or to an epitope destroyed upon cleavage of sCD30 from
3 intact CD30.

1 28. A nucleic acid of claim 27, wherein said antibody binds to an epitope
2 of CD30 selected from Epitope IIa and VI.

1 29. A nucleic acid of claim 27, further wherein said nucleic acid encodes a
2 polypeptide which is a therapeutic moiety.

1 30. An expression vector comprising a nucleic acid of claim 27 operably
2 linked to a promoter.

1 31. An expression vector comprising a nucleic acid of claim 28, operably
2 linked to a promoter.

1 32. An expression vector comprising a nucleic acid of claim 29 operably
2 linked to a promoter.

1 33. A method of inhibiting growth of a CD30+ cancer cell by contacting
2 said cell with an antibody that binds specifically to a stalk of CD30 (SEQ ID NO:1) of a cell,

3 or to an epitope destroyed upon cleavage of sCD30 from intact CD30, which antibody is
4 fused or conjugated to a therapeutic moiety, which therapeutic moiety inhibits growth of said
5 cell.

1 34. A method of claim 33, wherein said antibody is selected from the
2 group consisting of an scFv, a dsFv, a Fab, or a F(ab')₂.

1 35. A method of claim 33, wherein said antibody binds to an epitope
2 selected from the group consisting of Epitope IIa and VI.

1 36. A method of claim 33, wherein the therapeutic moiety is selected from
2 the group consisting of a cytotoxin, a drug, a radioisotope, or a liposome loaded with a drug
3 or a cytotoxin. therapeutic moiety is a cytotoxin.

1 37. A method of claim 36, wherein the cytotoxin is selected from the
2 group consisting of ricin A, abrin, ribotoxin, ribonuclease, saporin, calicheamycin, diphtheria
3 toxin, a *Pseudomonas* exotoxin, and botulinum toxins A through F.

1 38. An anti-CD30 antibody, wherein said antibody comprises a sequence
2 of at least one complementarity determining region ("CDR") shown in Figure 2 of a sequence
3 selected from the group consisting of SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:7, SEQ ID
4 NO:14, SEQ ID NO:15, SEQ ID NO:17, SEQ ID NO:22, SEQ ID NO:29, SEQ ID NO:38
5 and SEQ ID NO:39.

1 39. An anti-CD30 antibody of claim 38, wherein the antibody has a
2 variable heavy chain and a variable light chain, which chains have sequences selected from
3 the group consisting of: a variable heavy chain of SEQ ID NO:2 and a variable light chain of
4 SEQ ID NO:15 (antibody T6); a variable heavy chain having the sequence of SEQ ID NO:4
5 and a variable light chain having the sequence of SEQ ID NO:17 (antibody T13); a variable
6 heavy chain of SEQ ID NO:7 and a variable light chain of SEQ ID NO:22 (antibody T25), a
7 variable heavy chain of SEQ ID NO:14 and a variable light chain of SEQ ID NO:29
8 (antibody T105), and a variable heavy chain of SEQ ID NO:38 and a variable light chain of
9 SEQ ID NO:39 (antibody T201).

1 40. An antibody of claim 38 wherein the antibody is a disulfide stabilized
2 recombinant variable region ("dsFv").

1 41. An antibody of claim 39 wherein the antibody is a disulfide stabilized
2 recombinant variable region ("dsFv").

1 42. A composition comprising an antibody of claim 38, conjugated or
2 fused to a therapeutic moiety.

1 43. A composition of claim 42, wherein the therapeutic moiety is selected
2 from the group consisting of a cytotoxin, a drug, a radioisotope, or a liposome loaded with a
3 drug and a cytotoxin.

1 44. A composition of claim 43, wherein the cytotoxin is selected from the
2 group consisting of ricin A, abrin, ribotoxin, ribonuclease, saporin, calicheamycin, diphtheria
3 toxin, a *Pseudomonas* exotoxin, and botulinum toxins A through F.

1 45. A composition of claim 44, wherein said cytotoxin is a *Pseudomonas*
2 exotoxin selected from the group consisting of PE35, PE38, PE38KDEL, PE40, PE4E, and
3 PE38QQR.

1 46. A use of an anti-CD30 antibody, wherein said antibody comprises of at
2 least one complementarity determining region ("CDR") shown in Figure 2 of a sequence
3 selected from the group consisting of SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:7, SEQ ID
4 NO:14, SEQ ID NO:15, SEQ ID NO:17, SEQ ID NO:22, SEQ ID NO:29, SEQ ID NO:38
5 and SEQ ID NO:39 for the manufacture of a medicament to inhibit the growth of a CD30+
6 cancer cell.

1 47. A use of claim 46, wherein said antibody is a dsFv.

1 48. A use of a composition for the manufacture of a medicament for
2 inhibiting growth of a CD30+ cancer cell, which composition comprises an antibody of claim
3 46 conjugated or fused to a therapeutic moiety.

1 49. A use of claim 48, wherein the therapeutic moiety is selected from the
2 group consisting of a cytotoxin, a drug, a radioisotope, or a liposome loaded with a drug and
3 a cytotoxin.

1 50. A use of claim 49, wherein the cytotoxin is selected from the group
2 consisting of ricin A, abrin, ribotoxin, ribonuclease, saporin, calicheamycin, diphtheria toxin,
3 a *Pseudomonas* exotoxin, and botulinum toxins A through F.

1 51. A use of claim 50, wherein said *Pseudomonas* exotoxin is selected
2 from the group consisting of PE35, PE38, PE38KDEL, PE40, PE4E, and PE38QQR.

1 52. A nucleic acid encoding an anti-CD30 antibody, wherein said encoded
2 antibody comprises one or more complementarity determining regions ("CDRs") as set forth
3 in Figure 2 of a variable heavy or variable heavy chain selected from the group consisting of:
4 SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:7, SEQ ID NO:14, SEQ ID NO:15, SEQ ID
5 NO:17, SEQ ID NO:22, SEQ ID NO:29, SEQ ID NO:38 and SEQ ID NO:39.

1 53. A nucleic acid of claim 52, wherein said antibody is a dsFv.

1 54. A nucleic acid of claim 52, further wherein said nucleic acid encodes a
2 polypeptide which is a therapeutic moiety.

1 55. A nucleic acid of claim 54, further wherein said therapeutic moiety is a
2 drug or a cytotoxin.

1 56. A nucleic acid of claim 55, further wherein said cytotoxin is a
2 *Pseudomonas* exotoxin.

1 57. An expression vector comprising a nucleic acid of claim 52 operably
2 linked to a promoter.

1 58. An expression vector comprising a nucleic acid of claim 55, operably
2 linked to a promoter.

1 59. A method of inhibiting growth of a CD30+ cancer cell by contacting
2 said cell with an antibody having at least one complementarity determining region as shown
3 in Figure 2 of a variable heavy or variable light chain selected from the group consisting of
4 SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:7, SEQ ID NO:14, SEQ ID NO:15, SEQ ID
5 NO:17, SEQ ID NO:22, SEQ ID NO:29, SEQ ID NO:38 and SEQ ID NO:39, which antibody
6 is fused or conjugated to a therapeutic moiety, which therapeutic moiety inhibits growth of
7 said cell.

1 60. A method of claim 59, wherein said antibody is a dsFv.

1 61. A method of claim 59, wherein said therapeutic moiety is selected
2 from the group consisting of a cytotoxin, a drug, a radioisotope, or a liposome loaded with a
3 drug and a cytotoxin.

1 63. A method of claim 61, wherein the cytotoxin is selected from the
2 group consisting of ricin A, abrin, ribotoxin, ribonuclease, saporin, calicheamycin, diphtheria
3 toxin, a *Pseudomonas* exotoxin, and botulinum toxins A through F.

1 64. A method for detecting the presence of a CD30+ cell in a biological
2 sample, said method comprising:

3 (a) contacting cells of said biological sample with an anti-CD30 antibody
4 selected from the group consisting of: an antibody that binds specifically to a stalk of CD30
5 (SEQ ID NO:1) of a cell, or to an epitope destroyed upon cleavage of sCD30 from intact
6 CD30, and an antibody having at least one complementarity determining region as shown in
7 Figure 2 of a variable heavy chain or variable light chain selected from the group consisting
8 of SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:7, SEQ ID NO:14, SEQ ID NO:15, SEQ ID
9 NO:17, SEQ ID NO:22, SEQ ID NO:29, SEQ ID NO:38 and SEQ ID NO:39, said antibody
10 being fused or conjugated to a detectable label; and,

11 (b) detecting the presence or absence of said label,
12 wherein detecting the presence of said label indicates the presence of a CD30+ cell in said
13 sample.

1 65. A method of claim 64, wherein said antibody is selected from the
2 group consisting of an scFv, a dsFv, a Fab, or a F(ab')₂.

1 66. An antibody having at least one variable heavy chain or variable light
2 chain selected from the group consisting of SEQ ID NO:6, SEQ ID NO:11, SEQ ID NO:12,
3 SEQ ID NO:13, SEQ ID NO:21, SEQ ID NO:26, SEQ ID NO:27, SEQ ID NO:28, SEQ ID
4 NO:40, and SEQ ID NO:41.

1 67. An antibody of claim 66, wherein said antibody has a variable heavy
2 chain and a variable light chain selected from the group consisting of: (a) SEQ ID NO:6, and
3 SEQ ID NO:21 (antibody T24), (b) SEQ ID NO:11 and SEQ ID NO:26 (antibody T420), (c)

4 SEQ ID NO:12 and SEQ ID NO:27 (antibody T427), (d) SEQ ID NO:13 and SEQ ID NO:28
5 (antibody T405), and (e) SEQ ID NO:40 and SEQ ID NO:41 (antibody T408).

1 68. A composition comprising an antibody of claim 66 and a
2 pharmaceutically acceptable carrier.

1 69. A composition of an antibody of claim 67 and a pharmaceutically
2 acceptable carrier.

1 70. Use of an antibody of claim 66 for the manufacture of a medicament to
2 inhibit the growth of cancer cells expressing CD30.

1 71. A method for inhibiting the growth of cancer cells expressing CD30,
2 said method comprising administering to a patient having a CD30-expressing cancer a
3 therapeutically effective amount of an antibody having at least one variable heavy chain or
4 variable light chain selected from the group consisting of SEQ ID NO:6, SEQ ID NO:11,
5 SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:21, SEQ ID NO:26, SEQ ID NO:27, SEQ ID
6 NO:28, SEQ ID NO:40, and SEQ ID NO:41.

1 72. A method for inhibiting the growth of cancer cells expressing CD30,
2 said method comprising administering to a patient having a CD30-expressing cancer a
3 therapeutically effective amount of an antibody having the complementarity determining
4 regions ("CDRs") of variable heavy and variable light chains selected from the group
5 consisting of (a) SEQ ID NO:6, and SEQ ID NO:21 (antibody T24), (b) SEQ ID NO:11 and
6 SEQ ID NO:26 (antibody T420), (c) SEQ ID NO:12 and SEQ ID NO:27 (antibody T427), (d)
7 SEQ ID NO:13 and SEQ ID NO:28 (antibody T405), and (e) SEQ ID NO:40 and SEQ ID
8 NO:41 (antibody T408).

1 73. Use of an antibody having at least one complementarity-determining
2 region of a mouse monoclonal antibody designated as AC10 for the manufacture of a
3 medicament to inhibit the growth of cancer cells expressing CD30.

1 74. A use of claim 73, wherein the antibody has variable heavy and
2 variable light chains as in antibody AC10.

1 75. A method for inhibiting the growth of cancer cells expressing CD30,
2 said method comprising administering to a patient having a CD30-expressing cancer a

3 therapeutically effective amount of antibody having at least one complementarity-
4 determining region ("CDR") of a mouse monoclonal antibody designated as AC10.

1 76. A method of claim 75, wherein the CDRs of the variable heavy and
2 variable light chains of said antibody are as in antibody AC10.

1 77. A method of claim 76, wherein the variable heavy and variable light
2 chains of said antibody are as in antibody AC10.

1 78. An isolated nucleic acid encoding an antibody having the
2 complementarity determining regions ("CDRs") of variable heavy and variable light chains
3 selected from the group consisting of (a) SEQ ID NO:6, and SEQ ID NO:21 (antibody T24),
4 (b) SEQ ID NO:11 and SEQ ID NO:26 (antibody T420), (c) SEQ ID NO:12 and SEQ ID
5 NO:27 (antibody T427), (d) SEQ ID NO:13 and SEQ ID NO:28 (antibody T405), and (e)
6 SEQ ID NO:40 and SEQ ID NO:41 (antibody T408).

1 79. An isolated nucleic acid encoding an antibody having variable heavy
2 and variable light chains selected from the group consisting of (a) SEQ ID NO:6, and SEQ ID
3 NO:21 (antibody T24), (b) SEQ ID NO:11 and SEQ ID NO:26 (antibody T420), (c) SEQ ID
4 NO:12 and SEQ ID NO:27 (antibody T427), (d) SEQ ID NO:13 and SEQ ID NO:28
5 (antibody T405), and (e) SEQ ID NO:40 and SEQ ID NO:41 (antibody T408).

1 80. A host cell expressing an isolated nucleic acid encoding an antibody
2 having variable heavy and variable light chains selected from the group consisting of (a) SEQ
3 ID NO:6, and SEQ ID NO:21 (antibody T24), (b) SEQ ID NO:11 and SEQ ID NO:26
4 (antibody T420), (c) SEQ ID NO:12 and SEQ ID NO:27 (antibody T427), (d) SEQ ID NO:13
5 and SEQ ID NO:28 (antibody T405), and (e) SEQ ID NO:40 and SEQ ID NO:41 (antibody
6 T408).

1 81. A kit for detecting the presence of a CD30+ cancer cell in a biological
2 sample, said kit comprising:

3 (a) a container, and

4 (b) an anti-CD30 antibody selected from the group consisting of: an
5 antibody that binds specifically to a stalk of CD30 (SEQ ID NO:1) of a cell, or to an epitope
6 destroyed upon cleavage of sCD30 from intact CD30, and an antibody that has at least one
7 complementarity determining region having a sequence shown in Figures 2 and 6 of SEQ ID

8 NO:2, SEQ ID NO:4, SEQ ID NO:7, SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:17, SEQ
9 ID NO:22, SEQ ID NO:29, SEQ ID NO:38 and SEQ ID NO:39, which anti-CD30 antibody is
10 fused or conjugated to a detectable label.

1 82. A kit of claim 81, wherein said antibody is selected from the group
2 consisting of an scFv, a dsFv, a Fab, or a F(ab')₂.

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